MONTHLY OPERATIONS REPORT

MOR#036

Reporting period from 16-Nov-2016 to 15-Dec-2016

Reference: ***PROBA-V_D5_MOR-036_2016-12_v1.0***
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DOCUMENT CONTROL

Signatures

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Change record

Release	Date	Pages	Description	Editor(s)/Reviewer(s)
1.0	**20/12/2016**	All	Initial version	

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1. Summary

In this reporting period, the majority of the synthesis products were nearly complete. On November 17th, a planned on-board switch from the primary to the redundant lane was performed, causing loss of data for that day. Other factors that influenced data gaps were decompression errors and automatic recoveries, mainly due to the South Atlantic Anomaly. An increased amount of geometric errors have been observed in the past ten days. This will be closely investigated. No transfer frame files were missing this period.

There were no major issues with the image quality during this reporting period for the radiometric or geometric quality.

A successful validation of one year of reprocessed data of 'Collection 1' was performed by the VITO science team. This resulted in the decision to switch the NRT processing to use the new cloud detection algorithm. The switch was executed on December 5th, 2016 without any interruptions in the user subscriptions. At the same time, a first batch of Collection 1 (C1) data was released, along with L2A data. At the time of writing the report, February 2016 is being reprocessed onwards at a steady processing rate of 7-8 days of data per day. Expectation is that the complete reprocessing campaign should be finished at the end of January 2017.

No new developments are expected in the coming period.

2. System Infrastructure

Category	% Up Time	% Down Time
Switches	100.0	0.0
Database Servers	100.0	0.0
Mid Term File Servers	100.0	0.0
Short Term File Servers	100.0	0.0
Master Servers	100.0	0.0
Worker Nodes	100.0	0.0
PDF	99.99	0.01

Table 1: System Infrastructure availability for this reporting period

3. Image Processing Services

3.1. Ingested and archived products

Product Type	Total	Received	Missing data, ingested by VITO	Archived
METEO	240	240	0	238
TFF	300	300	0	300

Table 2: Ingested and archived products for this reporting period

3.2. Generated and archived products

Product Type	Total	Processed	Error	Archived
PROBAV_L1A - Calibration	449	447	2(*)	449
PROBAV_L1A - Nominal	2470	2459	11(**)	2461
PROBAV_L1C	2459	2459	0	2459
PROBAV_L3_S1_TOA_100M	30	30	0	30
PROBAV_L3_S1_TOC_100M	30	30	0	30
PROBAV_L3_S1_TOC_NDVI_100M	30	29	0	30
PROBAV_L3_S5_TOA_100M	6	6	0	6
PROBAV_L3_S5_TOC_100M	6	6	0	6
PROBAV_L3_S5_TOC_NDVI_100M	6	6	0	6
PROBAV_L3_S1_TOA_300M	30	30	0	30
PROBAV_L3_S1_TOC_300M	30	30	0	30
PROBAV_L3_S10_TOC_300M	3	3	0	3
PROBAV_L3_S10_TOC_NDVI_300M	3	3	0	3
PROBAV_L3_S1_TOA_1KM	30	30	0	30
PROBAV_L3_S1_TOC_1KM	30	30	0	30
PROBAV_L3_S10_TOC_1KM	3	3	0	3
PROBAV_L3_S10_TOC_NDVI_1KM	3	3	0	3

Table 3: Generated and archived products for this reporting period

(*) 2 x error generating calibration L1A
(**) 2 x Geometric processing, 9 x error generating L1A

3.3. Backup and archiving service

Product type	Total Files	Total File Size (GB)
TFF	295	721.57
L1A	2832	1252.12
Database transaction logs	1442	517.6
Database incremental back-up	8	8.93
Database full back-up	0(*)	0.0

Table 4: Back-up data volumes for this reporting period

(*) Due to an error in the archiving module, no full back-ups were made. Item is solved in the meanwhile.

Product type	Total Files	Total File Size (GB)
PROBAV_TRANSFERFRAMES	3135	8895.18
PROBAV_L1A	31998	16437.69
PROBAV_L1C	20013	22846.48
PROBAV_L3_S1_TOA_100M	523	11592.85
PROBAV_L3_S1_TOC_100M	570	12990.28
PROBAV_L3_S1_TOC_NDVI_100M	178	461.85
PROBAV_L3_S5_TOA_100M	44	3755.16
PROBAV_L3_S5_TOC_100M	18	1563.82
PROBAV_L3_S5_TOC_NDVI_100M	32	321.13
PROBAV_L3_S1_TOA_300M	151	1535.73
PROBAV_L3_S1_TOC_300M	222	2173.00
PROBAV_L3_S10_TOC_300M	57	1201.20
PROBAV_L3_S10_TOC_NDVI_300M	55	89.90
PROBAV_L3_S1_TOA_1KM	137	190.48
PROBAV_L3_S1_TOC_1KM	143	195.58
PROBAV_L3_S10_TOC_1KM	55	163.35
PROBAV_L3_S10_TOC_NDVI_1KM	55	11.99
ICP_GEOMETRIC_CENTRE	0	0
ICP_ GEOMETRIC _LEFT	0	0
ICP_ GEOMETRIC _RIGHT	0	0
ICP_RADIOMETRIC_CENTRE	1	0.04
ICP_RADIOMETRIC_LEFT	1	0.04
ICP_RADIOMETRIC_RIGHT	1	0.04
METEO_ECMWF	236	0.29
METEO_METEOSERVICES	234	1.25
POLARMOTION	1	0.00

Table 5: Archived data volumes for this reporting period

3.4. Dissemination service

Product type	Added to catalogue	Ordered	Delivered
PROBAV_L1C	2456	102	118
PROBAV_L3_S1_TOA_100M	30	70	71
PROBAV_L3_S1_TOC_100M	30	1713	3357
PROBAV_L3_S1_TOC_NDVI_100M	30	1029	1015
PROBAV_L3_S5_TOA_100M	6	417	405
PROBAV_L3_S5_TOC_100M	6	99	116
PROBAV_L3_S5_TOC_NDVI_100M	6	786	846
PROBAV_L3_S1_TOA_300M	30	211	230
PROBAV_L3_S1_TOC_300M	30	2147	51495
PROBAV_L3_S10_TOC_300M	3	80	82
PROBAV_L3_S10_TOC_NDVI_300M	3	275	304
PROBAV_L3_S1_TOA_1KM	30	334	328
PROBAV_L3_S1_TOC_1KM	30	1512	1874
PROBAV_L3_S10_TOC_1KM	3	397	405
PROBAV_L3_S10_TOC_NDVI_1KM	3	2109	4552

Table 6: Ordered and delivered products for this reporting period

3.5. End-user activity

15 new user(s) were registered in this reporting period.
The total number of users registered for PROBA-V data and that have ordered data is **1022** with **102** different nationalities representing **778** different companies/universities.

Product type	Africa	Asia	Europe	N-America	Oceania	S-America
PROBAV_L1C	0	4.29	252.48	0	0	0
PROBAV_L3_S1_TOA_100M	0.26	0.05	53.73	0.06	0	0
PROBAV_L3_S1_TOC_100M	0	438.41	539.70	751.27	0	3.30
PROBAV_L3_S1_TOC_NDVI_100M	1.15	70.43	2.46	0.06	0	0.02
PROBAV_L3_S5_TOA_100M	273.24	0	1.68	0	0	50.70
PROBAV_L3_S5_TOC_100M	23.47	2.22	691.04	0.92	0	0.53
PROBAV_L3_S5_TOC_NDVI_100M	55.19	16.75	11.82	0.14	0.29	21.48
PROBAV_L3_S1_TOA_300M	0.00	1.64	1635.75	0.00	0	0
PROBAV_L3_S1_TOC_300M	0	0	3801.35	358.39	0	1.45
PROBAV_L3_S10_TOC_300M	3.58	0.72	168.49	0.09	0	0
PROBAV_L3_S10_TOC_NDVI_300M	0.00	1.42	17.58	0.07	0	0.41
PROBAV_L3_S1_TOA_1KM	0	0	343.22	0	0	0

PROBAV_L3_S1_TOC_1KM	0.00	0	818.51	0	0	0.00
PROBAV_L3_S10_TOC_1KM	0.45	82.56	21.51	0.76	0	0
PROBAV_L3_S10_TOC_NDVI_1KM	0.07	43.80	8.76	0.00	0	0.40

Table 7: Data download (GB) in total per Origin of the User for the reporting period

Product Type	Global
L1C	256.77
PROBAV_L3_S1_TOA_100M	54.10
PROBAV_L3_S1_TOC_100M	1732.67
PROBAV_L3_S1_TOC_NDVI_100M	74.11
PROBAV_L3_S5_TOA_100M	325.63
PROBAV_L3_S5_TOC_100M	718.18
PROBAV_L3_S5_TOC_NDVI_100M	105.66
PROBAV_L3_S1_TOA_300M	1637.40
PROBAV_L3_S1_TOC_300M	4161.19
PROBAV_L3_S10_TOC_300M	172.87
PROBAV_L3_S10_TOC_NDVI_300M	19.49
PROBAV_L3_S1_TOA_1KM	343.22
PROBAV_L3_S1_TOC_1KM	818.52
PROBAV_L3_S10_TOC_1KM	105.28
PROBAV_L3_S10_TOC_NDVI_1KM	53.03

Table 8: Data download (GB) in total for the reporting period

Company	# Downloads
UNIVERSITY OF LEICESTER	46773
GOOGLE	5047
VITO	3038
JXNU	3032
CELSIUSPRO	2475
IFSULDEMINAS	690
METEO FRANCE	670
JINGMEN UNIVERSITY	471
UCLOUVAIN	456
IGIK	414

Table 9: Top 10 user companies for the reporting period

Country	# Users
CHINA	99
BELGIUM	90
FRANCE	55
ITALY	53
BRAZIL	45
UNITED STATES	44
UNITED KINGDOM	42
INDIA	36
NETHERLANDS	35
GERMANY	34

Table 10: Top 10 countries with most registered users

List of issues raised by users:

- collection Level 1C [C1] access rights
- disk space on VM
- calendar ordering problem
- Free proba data
- SPOT & Proba S10 NDVI-products
- First S10 of Dec: full C1 or combination C0-C1?
- availaibility of V101 data
- Owrangi - username
- help ! About transit time
- Mosaicking files for Africa
- Problem in India Administration Layer

4. Image Calibration services

4.1. Radiometric Calibration

Calibration request type	Total	Processed	Not received	Error
CLOUDS	15	15	0	0
DARK CURRENT	20	20	0	0
MOON	2	2	0	0
RAYLEIGH	54	54	0	0
SNOW	84	83	0	1
SUN_GLINT	0	0	0	0

Table 11: Calibration Image requests for this reporting period

Calibration image type	Total	Valid	Invalid
PROBA_V_L1A_CALIBRATION	2	2	0
PROBA-V_L1B_CALIBRATION	445	392	53
PROBA-V_L1B_INTERSECTION	743	311	432
PROBA-V_L1B_OVERLAPREGION	0	0	0

Table 12: Processed calibration images for this reporting period

(*) Due to insufficient overlap with the calibration region of interest, not enough pixels (e.g. clouds contamination), site not sufficiently uniform (illumination), etc.

Long-term monthly Libya-4 mean plots for different cameras are given in Figure 1, Figure 2 and Figure 3. Deep convective clouds interband calibration results are given in Figure 4.

The DCC interband calibration results for LEFT and CENTER BLUE still show a slight decrease. The previously reported decrease in CENTER and RIGHT NIR DCC interband results is less clear based on the latest results. Investigations to evaluate the need for an update of the absolute calibration coefficients for these bands is still on-going.

Radiometric ICP file

The dark values and the SWIR absolute calibration coefficients will be updated following the linear degradation model.

The current ICP files are

- PROBAV_ICP_RADIOMETRIC#LEFT_20161201_V01
- PROBAV_ICP_RADIOMETRIC#CENTER_20161201_V01
- PROBAV_ICP_RADIOMETRIC#RIGHT_20161201_V01

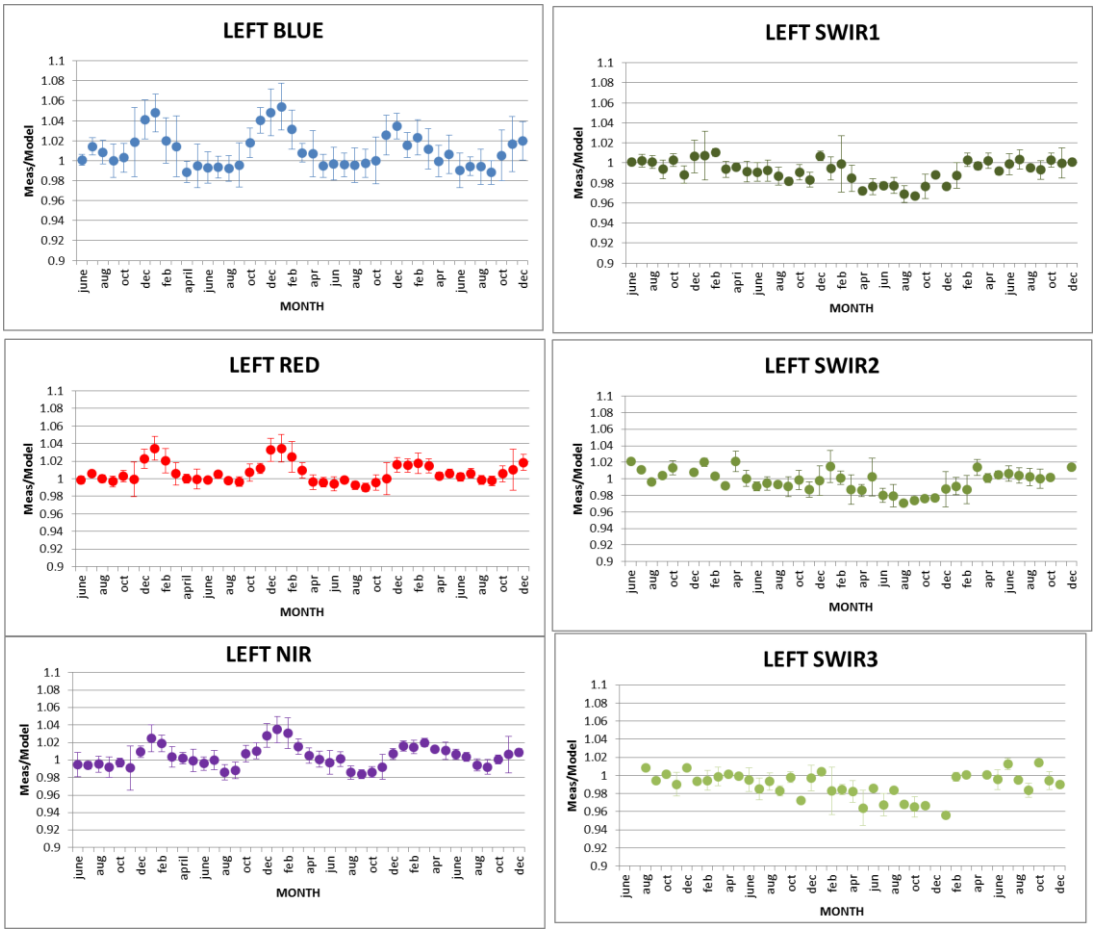

Figure 1. Libya-4 desert calibration results: LEFT monthly averaged results

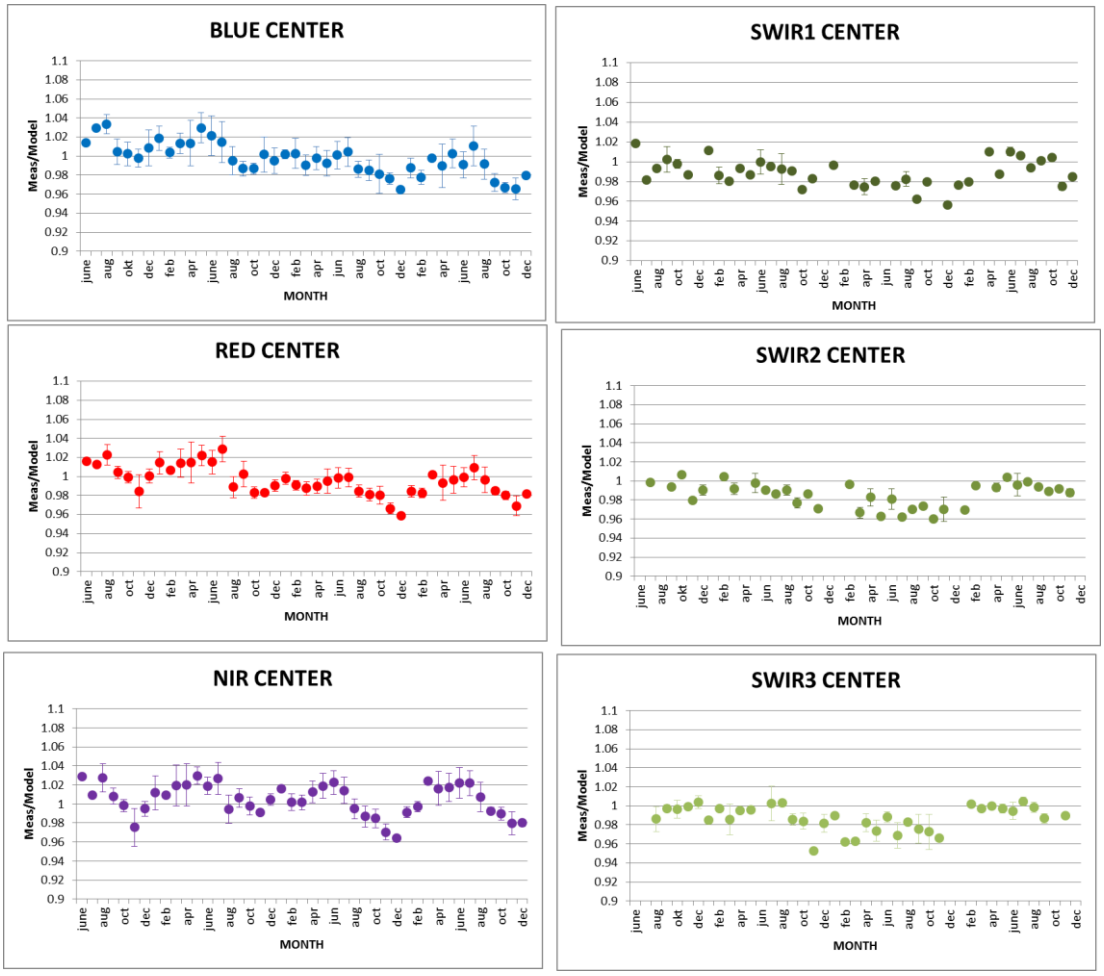

Figure 2. Libya-4 desert calibration results: CENTER monthly averaged results

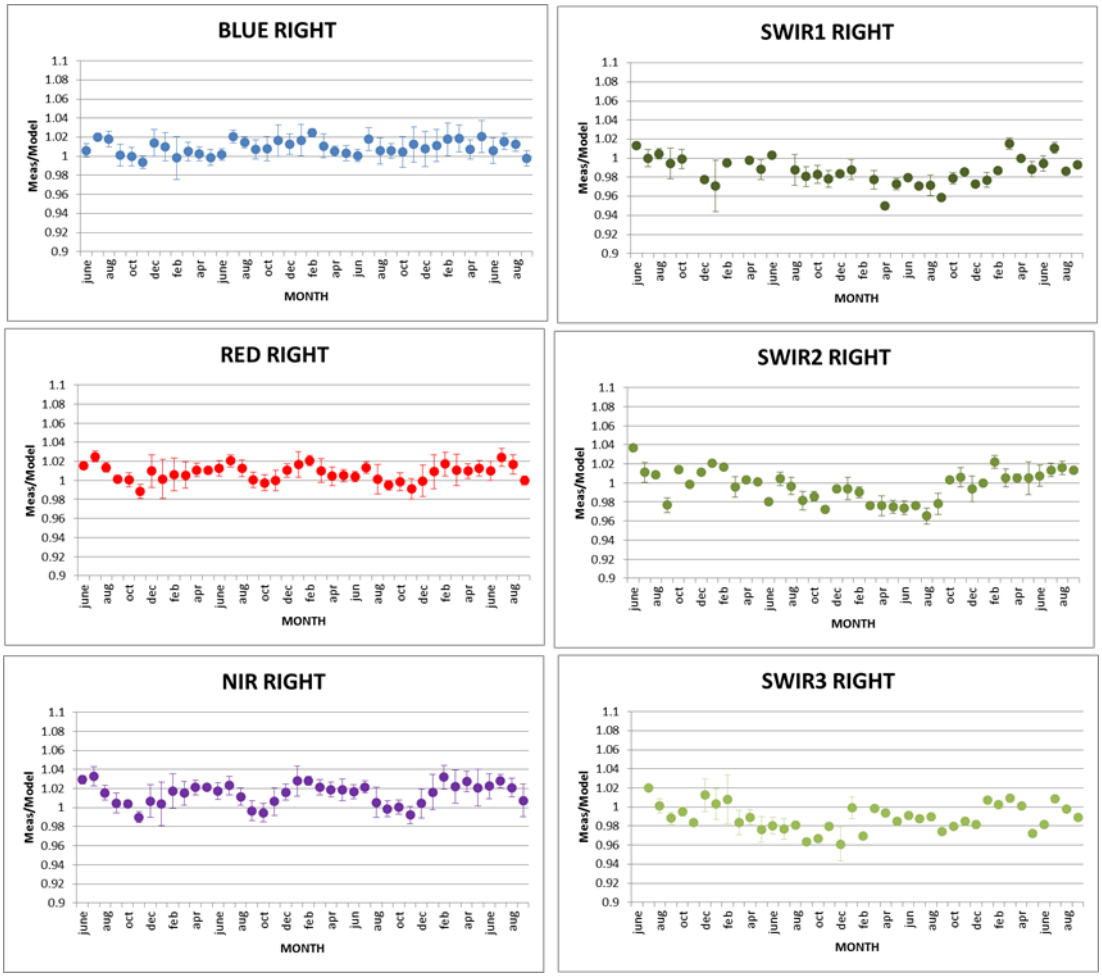

Figure 3. Libya-4 desert calibration results: RIGHT monthly averaged results

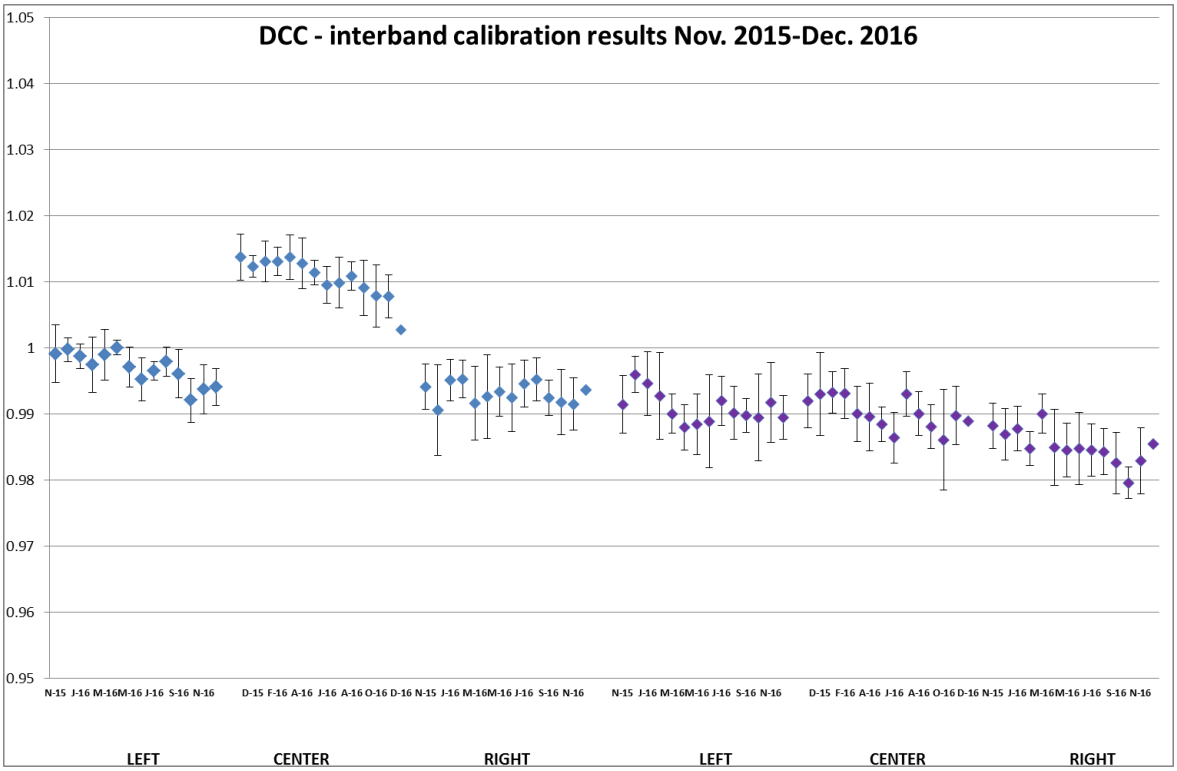

Figure 4. DCC inter-band calibration results: LEFT, CENTER and RIGHT camera

4.2. Geometric Calibration

Calibration image type	Total	Processed	Error
PROBA-V_L1C_INTERSECTION	13157	13157	0

Table 13: Processed calibration images for this reporting period

During previous month, the average ALE was < 77 m (σ < 94 m). Daily values started relatively high and peaked at 100 m on 19/11, followed by a decrease to values hovering around 70 m until 6/12. This stable period was followed by an increase to a maximum of 102 m (BLUE) on 11/12, after which the ALE decreased again to values of 60 – 70 m.

The geometric accuracy was within the requirement of < 300 m, with an average compliance for all cameras of 99.2% (98.7 – 99.7% from BLUE to SWIR). Daily values dropped to minima generally coinciding with the ALE maxima, with lowest values of 97.8% and 98.3% for the BLUE channel on 19/11 and 9/12, respectively.

Geometric ICP file

- PROBAV_ICP_GEOMETRIC#LEFT_20160907_V01
- PROBAV_ICP_GEOMETRIC#CENTER_20160907_V01
- PROBAV_ICP_GEOMETRIC#RIGHT_20160907_V01

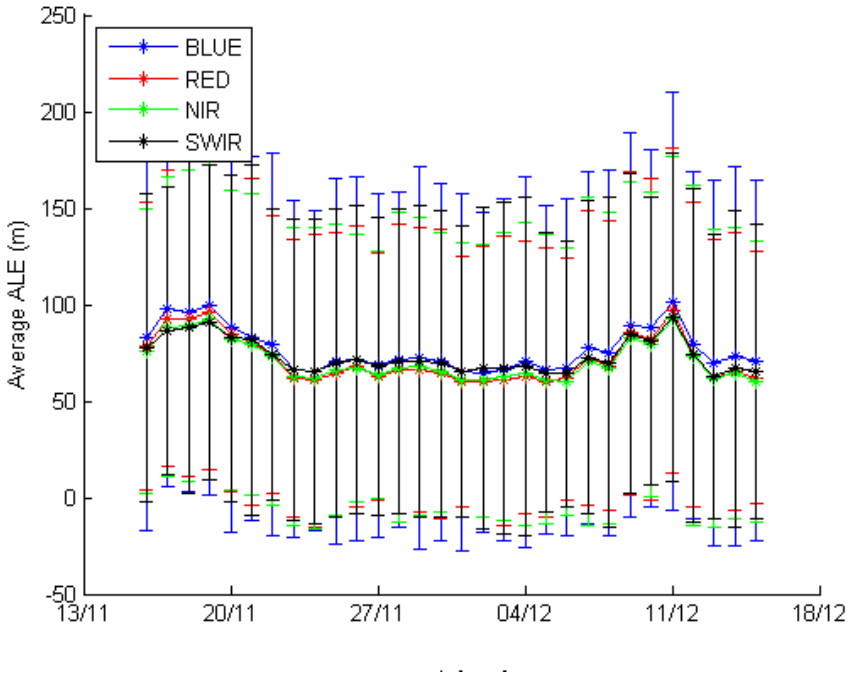

Figure 5 - Daily ALE evolution for all PROBA-V spectral bands for period 16/11 -15/12

5. Anomalies

5.1. System related issues

A detailed description of each issue is available in the issue tracking system http://jira.vgt.vito.be

Key	Summary	Status	Created	Component/s
PROBAVUS-7	Very small images fail to process	Resolved	10/01/2014	General
PROBAVUS-60	LTDA Restore fails when product destination already exists on disk	Open	22/01/2016	Software
PROBAVUS-63	Cloud shadow detection at high solar zenith angles not working properly	Open	11/05/2016	Software
PROBAVUS-65	Processing statuses L2 products	Open	16/09/2016	Software
PROBAVUS-66	Cloud cover percentages on PDF products are not reliable	Open	19/10/2016	PDF
PROBAVUS-67	PDF customization.exe: L2 geotiff bands are not grouped	Open	25/11/2016	Software

1 new issues was logged during this reporting period
0 issue(s) was resolved and closed during this reporting period
0 issues are resolved but remain to be closed formally
1 issue is resolved but remain in the list logging purposes
5 issue(s) is open and remain to be solved

5.2. Image processing issues

A detailed description of each issue is available in the Weekly Report and the image processing tracking system https://juniper.vgt.vito.be/ciptools

The below table gives an overview of the S1's of this reporting period:

	# S1	Dates
Major Gaps (> 21600 km² (missing TFF))	1	17/11
Large Gaps (< 21600 km²)	0	
Medium Gaps (< 10000 km²)	5	10/12, 23/11, 26/11, 21/11, 06/12
Minor Gaps (< 3600 km²)	8	14/12, 09/12, 04/12, 07/12, 12/12, 05/12, 11/12, 16/11
Negligible Gaps (< 1000 km²)	16	02/12, 27/11, 22/11, 30/11, 15/12, 20/11, 25/11, 01/12, 29/11, 24/11, 19/11, 13/12, 08/12, 18/11, 28/11, 03/12
Complete synthesis (no gaps)	0	

Table14: Overview of S1 for this reporting period

Synthesis	Missing	Decom. Error	Geom. Error	Missing TFF	Autom. Recovery	VC4 Missing	Create Contours	Other
20161116	2.11%	47	9					
20161117	34.90%	11	6					1
20161118	2.81%	2	8					
20161119	2.78%	2	8					
20161120	4.86%		24					
20161121	1.61%	3	16		2			
20161122	0.05%		13					
20161123	3.78%	9	17		2	1		1
20161124	0.03%	2	6					
20161125	0.05%		4					
20161126	2.96%	3	11		1			
20161127	0.29%	1	1					
20161128	4.56%	2	4					
20161129	1.60%	1	7					
20161130	0.40%	1	4					
20161201	0.02%		6					
20161202	0.03%		5					
20161203	0.02%	3						
20161204	5.83%	4	8			1		
20161205	3.69%	4	5					
20161206	5.30%	6	12		1			
20161207	0.33%	5	4		1			
20161208	0.53%	1	10					
20161209	0.30%	2	12		1			
20161210	2.84%	10	24			1		
20161211	1.56%	2	19		1		1	
20161212	1.28%	1	15		1			
20161213	0.25%		21					
20161214	3.33%	3	31		1		1	
20161215	0.12%	1	16					

Table 15: List of synthesis with an error overview of the missing percentages and errors for this reporting period

6. Scheduled activities for the next period(s)

- Software upgrades:
  No software upgrades planned

- Hardware:
  No hardware upgrades planned

- Development:
  No developments are planned in the near future

- No other activities scheduled.

7. Operational remarks

The reprocessing campaign is running at a steady rate of 7-8 days of data per day. It is expected that the entire campaign will be finished by end of January/early February. Once Collection 1 (C1) is complete, Collection 0 will be made unavailable to end-users. Collection 0 will only be available from archive tapes.